Astrophysics and Geophysics

BUILDING A GEOMAGNETIC SUBSTORM DATABASE

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During the summer of 2002, 12 months of mid-latitude, ground-based magnetometer data was compiled for the purpose of locating the data signatures of geomagnetic substorms. Magnetometer data was first configured into stack plots for easy identification of substorms. Once a list of substorms was constructed, local time-universal time maps were formed from the stack plots. From these plots, onset times, peak times, and magnitudes were collected. Also, ultraviolet satellite images of the aurora borealis were collected, when available, to make high-latitude to mid-latitude data comparisons. This data was then condensed into a database containing hard and electronic copies of graphs, images, and tables of dates and times available for future research.

This talk will first cover the basics of geomagnetic substorms- from the solar wind to magnetic reconnection to the basic stages of the Near Earth Neutral Line model. Then the steps taken of data acquisition are discussed, along with the results of early data comparisons. Potentials for data use will wrap up the presentation.